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ABSTRACT

Project CAPABLE (Classroom Action Program: Aim: Basic Learning Effectiveness) is a classroom approach which integrates the basic learning skills with content. The goal of the project is to use basic learning skills to enhance the learning of content and at the same time use the content to teach basic learning skills. The report evaluates the 1981-82 Project CAPABLE program at Madawaska High School (Maine) for significant student achievement gains in basic skills and subject content as compared to achievement gains for control groups. Nine teachers from the English, science, math, social studies, French, business, and special education departments and 295 students, grades 7 through 12, participated. Four instruments were administered as pretests and posttests: (1) the Stanford Diagnostic Reading Test; (2) the Maine Assessment and Planning for Schools--Reading; (3) a teacher-designed content test; and (4) the Watson-Glaser Critical Thinking Appraisal. Analysis of variance, covariance, and t-tests were performed. Students who participated in Project CAPABLE showed statistically significant gains (.05) in their basic learning skills and subject area content achievement as compared to the control group. (BS)

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Project CAPABLE

Evaluation Report

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Project CAPABLE Evaluation Report

ABSTRACT

The staff of Madawaska High School recognizes that many high school students have difficulty learning because they lack the basic learning skills necessary to make effective learning possible. The purpose of Project CAPABLE is to design and implement an instructional program which will help students become more capable learners through the acquisition of basic learning skills. In order to accomplish this goal, the first year of the project was devoted to research, workshops, and inservice training for the development of activities and exercises in a Classroom Action Program. The Classroom Action Program was designed to increase the students' proficiency in subject content and basic learning skills, especially in the areas of comprehension, vocabulary and concept development, DRTA & SQ3R, study skills, classroom management, structured overviews and study guides, program evaluation, and interest and motivational inventories. During the second project year the team wrote and field tested exercises and activities for the Classroom Action Program. This year, the third year, was devoted to implementing, evaluating, and revising the model and materials for the program.

NEED

As a result of a workshop with the teachers of Madawaska High School, the teachers identified a need for a program that will upgrade student proficiency in basic learning skills.

OBJECTIVE

As a result of Project CAPABLE, the participating high school students (grades 7-12) will show, from pretesting in September and post-testing in June, a significant gain (.05) in their command of basic learning skills and significant increase (.05) in their achievement in subject area content as compared to control groups.

PROJECT POPULATION - COMMUNITY

Madawaska High School is located in Madawaska, Maine. Madawaska is a town of 5800 people in the northern part of the state on the border with Canada. The town's major industry is Frasier Paper Ltd. which employs a majority of the fathers of our students. Approximately 15% of our students come from farm families in the rural Madawaska area.

The majority of families are of French-Canadian descent. At least 80% of the homes are bilingual, with both French and English being spoken. French is the dominant language in over 60% of these homes. Most of our students have the advantage of speaking and understanding two languages. However, the strong Anglo-French influence in the home does adversely affect the verbal competency in English of many of our students.

PROJECT POPULATION - SCHOOL

Madawaska High School is accredited by the New England Association of Schools and Colleges and by the State of Maine Department of Education. The curricula offered are as follows: (1) college prep., (2) business education, (3) industrial education, (4) home economics, (5) vocational education, and (6) a flexible elective program.

The school, grades 7-12, is staffed by 42 teachers, 30 males and 12 females. The average age is 42 years with an average experience of 18 years. Madawaska's teaching staff is very stable.

The school has an enrollment of 690 students, grades 7-12. 345 of these are boys and 345 are girls. During the past school year, 1981-82, the twelfth grade had 130 students (72 boys, 58 girls), the eleventh grade had 132 students (60 boys, 72 girls), the tenth grade had 120 students (54 boys, 66 girls), the ninth grade had 100 students (55 boys, 45 girls), the eighth grade had 99 students (56 boys, 43 girls), and the seventh grade had 109 students (48 boys, 61 girls). The total population of Madawaska School District is 1250.

Approximately 45% of our students continue their education. About 22% attend a four year college. A follow-up study was made of the graduating class of 1976. 118 of the 149 graduates responded, 67 males and 51 females. The report showed the following results five years after graduation:

1. 38% were married;
2. 14% had joined the armed forces;
3. 21 had completed four or more years of college;
4. 1 had completed a three year program of studies;
5. 21 had completed a two year program of studies;
6. 4 had completed a one year program of studies;
7. 9 were still enrolled in a program of studies;
8. 10 started but did not complete a program of studies;
9. types of jobs held were widely varied;
10. 14% are employed by Fraser Paper;
11. 53% are still living in the Madawaska area.

PROJECT CAPABLE TEACHERS

The project team in 1979 was made up of nine teachers, (2 co-directors and 7 other participants) from the following departments: English, science, math, social studies, French, business, and special education. Over the three year period, five teachers have dropped out for a variety of reasons (RIF, further education, move) and one teacher has been added. The project team is now composed of five teacher, (one director and 4 other participants) in the areas of English, science, social studies, French, and business. Three of these teachers are male and two are female. The average age is 39.3 years with an average of 17 years teaching experience.

PROJECT CAPABLE STUDENTS

Project CAPABLE involved 295 students (151 boys and 144 girls) in grades 7-12. 27 students were seventh graders, 67 were eighth graders, 120 were ninth graders, 66 were tenth graders, 4 were eleventh graders, and 11 were twelvth graders. Of the 295 students in the project, 42 spoke English only while 252 were bilingual. Of the bilingual students, 87 preferred to speak French in the home while 165 preferred English.

PROJECT DESIGN

During the first and second years of the project, participating teachers developed units designed to improve both the learning of basic learning skills and the learning of content. These units were implemented and their effect evaluated during the third year, this past school year, 1981-82.

Participating classes were scheduled by the principal during the

summer before the study year with no special random selection process being used to choose students for those classes. Classes were taken as usually scheduled. This scheduling procedure normally includes tracking students somewhat homogeneously according to ability. As a result, control groups and experimental groups were not assumed to be alike with respect to ability at the beginning of the study.

In August, the project teachers selected those groups which were to be experimental groups and those which were to be control. Table 1 shows the number of control and experimental groups chosen by each teacher and the number of students in each group. One teacher was unable to designate a control group. Three teachers selected at least one of their classes to be a control group and at least one other to be the experimental. A fifth teacher selected classes taught by other teachers to serve as control groups.

TABLE 1. Participating Teachers, Control Groups, and Experimental Groups

TEACHER	CONTROL		EXPERIMENTAL	
	# of groups	# of students	# of groups	# of students
1	1	24	2	23 17
2	1	17	1	24
3	2	20 25	2	25 14
4 *			2	12 14
**	2	27 27		
5			1	12

* = project teacher; ** = non-project teacher

All students were pretested in August and September. The following instruments were administered:

1. Stanford Diagnostic Reading Test (SDRT) by Bjorn Karlsen, Richard Madden and Eric F. Gardiner. Published by Harcourt Brace Jovanovich, Inc. of New York, 1978. This test was given to determine if the experimental groups showed greater achievement than the control group in the following areas of basic learning skills: literal comprehension, inferential comprehension, word meaning, word parts, scanning, skimming, and fast reading.

2. Maine Assessment and Planning for Schools - Reading by the Maine State Department of Education and Cultural Services, Augusta, Maine, 1980. This test was given to determine if the experimental group showed greater achievement than the control group in the following areas of basic learning skills: word analysis - vocabulary, literal comprehension, interpretive comprehension, evaluative comprehension, study skills, and interest and appreciation.

3. A teacher-designed content test was given to determine if the experimental group showed greater achievement than the control group as a result of Project CAPABLE.

4. Watson-Glaser Critical Thinking Appraisal by Goodwin Watson and Edward M. Glaser. Published by The Psychological Corporation - Harcourt Brace Jovanovich, Inc., 1980. This test was given to determine if the experimental group showed greater achievement than the control group in the following areas of critical thinking skills: inference, assumption, deduction, integration, and arguement.

5. Differential Aptitude Test scores and SRA Achievement Series - Level H scores were obtained from student records. These scores were used to determine if there was any difference in the learning ability between experimental and control groups and, if there was, use this data for analysis of covariance to represent the covariate.

During the ensuing school year the experimental and control groups received different treatment. The experimental group received all of the project techniques in four selected chapters or units of work, while the control group did not. Project techniques included the following: directed reading, listening and observing activities, SQ6R, vocabulary, concept development, structural overviews, advanced organizers, study skill exercises, and study guides. Log books were kept to record the differences in treatment and to make subjective formative evaluations as the course progresses.

In April, alternate forms of the SDRT, MAPS, Teacher-designed content test, and WGCTA were again administered as posttests.

DATA

The following tables summarize the analysis of our data:

Table 2. Definition of Abbreviations
Table 3. Analysis of Variance on DAT and SRA Scores
Table 4. Analysis of Variance on Pretest Scores
Table 5. Analysis of Variance on Posttest Scores
Table 6. t-Test on Pre and Posttest Gains for Control Group
Table 7. t-Test on Pre and Posttest Gains for Experimental Group
Table 8. Analysis of Covariance

Table 2. Definition of Abbreviations

DATVR	DAT Verbal Reasoning - Percentile
C	DAT Composite - Percentile
SRAC	SRA Composite - Percentile
VML	SRA Literal Vocabulary Meaning
VMNL	SRA Non-literal Vocabulary Meaning
MC	SRA Composite Vocabulary Meaning
CGD	SRA Grasping Detail Comprehension
CS	SRA Summarizing - Comprehension
CPR	SRA Perceiving Relationships Comprehension
CDC	SRA Drawing Conclusions Comprehension
CUA	SRA Understanding Author Comprehension
CC	SRA Comprehension Composite
RMD	SRA Reference Material, Dictionary
RMP	SRA Reference Material, Parts of a Book
RMSI	SRA Reference Material, Source of Information
RMMGT	SRA Reference Material, Maps, Graphs, Tables
RMC	SRA Reference Material Composite
SDRTRCL	SDRT Reading Comprehension, Literal
RCI	SDRT Reading Comprehension, Inferential
RCT	SDRT Reading Comprehension, Total
WM	SDRT Word Meaning
WP	SDRT Word Parts
RA	SDRT Rate of Reading, Scan
RB	SDRT Rate of Reading, Skim
RT	SDRT Rate of Reading, Skim & Scan Total
FR	SDRT Rate of REading, Fast Reading
CONTENT	Subject Area Content Test
WGCTAI	WGCTA Inference
A	WGCTA Assumption
D	WGCTA Deduction
INT	WGCTA Integration
ARG	WGCTA Arguement
T	WGCTA Total
PER	WGCTA Percentile
MAPSWA	MAPS Word Analysis
V	MAPS Vocabulary
CL	MAPS Literal Comprehension
CI	MAPS Interpretive Comprehension
CE	MAPS Evaluative Comprehension
CT	MAPS Total Comprehension
SS	MAPS Study Skills
IA	MAPS Interest, Appreciation
T	MAPS Total

Table 3. ANALYSIS OF VARIANCE ON DAT & SRA SCORES

Analysis of variance was performed on DAT and SRA scores to determine what, if any, significant differences existed between experimental and control groups at the beginning of the study concerning learning ability.

Variable Code	EXPERIMENTAL			CONTROL			F-RATIO	F-PROB	SIGN.
	$\bar{X}$	SD	N	$\bar{X}$	SD	N			
DATVR	50.27	27.76	108	53.57	25.96	83	0.700	0.4038	
C	56.23	27.63	105	62.61	23.03	83	2.861	0.0924	
SRAC	65.18	30.31	148	63.48	22.17	130	0.277	0.5990	
VML	16.65	5.59	150	16.73	7.67	131	0.008	0.9297	
VMNL	11.37	6.14	150	10.11	5.32	131	3.331	0.0690	
MC	28.10	8.29	150	26.53	6.85	131	2.927	0.0882	
CGD	5.99	2.50	150	6.75	2.18	131	7.313	0.0073	**
CS	4.42	1.98	150	4.01	1.87	131	3.204	0.0746	
CPR	9.11	3.56	150	9.30	2.83	131	0.227	0.6343	
CDC	9.39	3.33	150	9.85	2.67	131	1.557	0.2131	
CUA	5.59	2.48	150	4.84	2.13	131	7.359	0.0071	**
CC	34.51	11.05	150	34.66	7.95	131	0.017	0.8974	
RMD	6.86	2.27	151	7.23	2.32	133	1.856	0.1741	
RMP	3.95	1.69	151	4.74	1.87	133	13.956	0.0002	**
RMSI	9.03	3.66	151	7.95	3.20	133	6.903	0.0091	**
RMMGT	8.87	3.15	151	8.80	2.69	133	0.032	0.8575	
RMC	29.44	8.50	151	29.60	6.32	133	0.032	0.8573	

* .05 significance ** .01 significance

Table 4. ANALYSIS OF VARIANCE ON PRETEST SCORES

Analysis of variance was performed on pretest scores to determine what, if any, significant differences existed between experimental and control groups with respect to initial proficiency in basic learning skills and content.

Variable Code	EXPERIMENTAL			CONTROL			F-RATIO	F-PROB	SIGN.
	$\bar{X}$	SD	N	$\bar{X}$	SD	N			
SDRTRCL	16.79	6.92	154	14.88	7.86	112	4.392	0.0371	*
RCI	17.85	5.72	154	16.54	7.15	112	2.736	0.0993	
RCT	34.55	12.13	154	31.43	14.70	112	3.576	0.0597	
WM	16.39	5.29	152	16.38	4.71	138	0.000	0.9957	
WP	18.31	5.53	152	18.46	5.56	138	0.056	0.8127	
RA	7.86	2.87	154	7.80	2.82	136	0.034	0.8529	
RB	7.84	3.15	154	8.36	3.26	133	1.906	0.1685	
RT	15.74	5.09	154	15.96	5.61	136	0.118	0.7319	
FR	10.21	4.78	149	10.27	4.06	135	0.016	0.9007	
CONTENT	35.62	19.31	154	34.12	10.96	137	0.642	0.4237	
WGCTAI	6.65	2.54	40	6.04	2.36	23	0.876	0.3530	
AA	10.25	2.62	40	9.22	2.76	23	2.181	0.1448	
AD	9.05	2.40	40	9.35	2.52	23	0.218	0.6425	
INT	8.92	2.81	39	9.87	2.82	23	1.636	0.2058	
ARG	9.43	2.99	35	8.76	3.42	21	0.585	0.4477	
AT	42.65	9.58	40	42.48	8.69	23	0.005	0.9437	
PER	47.62	31.24	40	42.35	25.10	23	0.314	0.5774	
MAPSWA	5.56	1.89	131	6.49	1.74	122	16.400	0.0001	**
SV	3.81	2.03	154	4.78	2.16	138	15.857	0.0001	**
CL	6.14	1.90	114	6.10	1.85	114	0.031	0.8603	
CI	5.98	2.55	154	6.06	2.42	138	0.084	0.7720	
CE	5.19	2.34	154	4.63	2.38	138	4.154	0.0424	*
CT	15.64	5.99	154	15.73	5.97	138	0.016	0.8989	
SS	10.77	4.13	154	11.07	3.31	138	0.439	0.5082	
IA	0.6087	0.66	23	0.37	0.62	16	1.252	0.2704	
ST	35.10	9.16	154	37.04	8.99	138	3.344	0.0685	

* .05 significance ** .01 significance

Table 5. ANALYSIS OF VARIANCE ON POSTTEST SCORES

Analysis of variance was performed on the posttest scores to determine what, if any, significant differences existed between experimental and control groups after treatment of experimental groups with Project CAPABLE.

Variable Code	EXPERIMENTAL			CONTROL			F-RATIO	F-PROB	SIGN.
	$\bar{X}$	SD	N	$\bar{X}$	SD	N			
SDRTCL	19.74	6.73	148	16.24	7.62	135	16.754	0.0001	**
CI	19.80	5.84	148	17.29	6.03	135	12.694	0.0001	**
RCT	39.53	11.88	148	33.53	13.11	135	16.223	0.0001	**
WM	18.45	5.42	148	16.75	5.89	135	6.428	0.0118	*
WP	20.53	5.24	148	19.05	6.14	135	4.751	0.0301	*
RA	9.38	2.91	148	8.26	3.39	135	8.916	0.0031	**
RB	9.07	3.79	148	3.74	8.06	135	5.062	0.0252	*
RT	18.45	5.79	148	16.30	6.13	135	9.126	0.0028	**
FR	12.87	5.30	148	12.30	6.86	135	0.630	0.4281	
CONTENT	58.74	26.08	148	46.68	14.76	134	22.227	0.0000	**
WGCTAF	9.05	11.99	39	6.87	1.68	23	0.747	0.3910	
AA	10.18	2.58	39	10.26	3.09	23	0.012	0.9118	
AD	10.23	8.46	39	9.17	2.17	23	0.344	0.5598	
INT	11.97	13.05	39	9.30	3.81	23	0.911	0.3436	
ARG	11.33	7.47	39	10.83	3.75	23	0.092	0.7627	
AT	47.59	10.41	39	46.91	5.87	23	0.082	0.7760	
PER	56.97	26.50	39	55.87	20.21	23	0.030	0.8639	
MAPSWA	6.12	3.56	124	6.53	2.09	118	1.192	0.2761	
SV	3.67	2.34	147	4.46	2.47	134	7.582	0.0063	**
CL	4.80	2.89	147	5.09	4.31	134	0.436	0.5094	
CI	6.07	4.27	147	6.34	2.57	134	0.396	0.5296	
CE	3.99	2.79	147	3.50	2.16	134	2.705	0.1011	
CT	14.18	4.00	147	14.87	7.64	134	0.919	0.3386	
SS	11.31	4.20	147	12.23	3.19	133	4.126	0.0432	*
IA	0.79	0.78	24	2.39	7.17	18	1.182	0.2835	
ST	33.68	7.46	147	36.74	6.33	133	13.589	0.0003	**

* .05 significance ** .01 significance

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Table 6. t-TEST ON PRE AND POSTTEST GAINS FOR CONTROL GROUP

t-Tests were performed on the gains of posttest scores over pretest scores to determine what, if any, significant gains were made by the control group. These gains can then be compared to those of the experimental group.

Variable Code	N	PRETEST		POSTTEST		T-VALUE	TWO-TAILED PROB.	SIGN.
		$\bar{X}$	SD	$\bar{X}$	SD			
SDRT RCL	107	14.93	7.82	16.95	8.11	-4.34	0.000	**
RCI	107	16.56	7.14	17.60	6.42	-2.29	0.000	**
RCT	107	31.49	14.64	34.54	14.10	-3.84	0.000	**
WM	133	16.30	4.70	16.89	5.81	-1.63	0.000	**
WP	133	18.38	5.55	19.26	5.90	-2.02	0.000	**
RA	131	7.73	2.82	8.44	3.256	-2.67	0.000	**
RB	128	8.37	3.25	8.20	3.73	-0.39	0.289	
RT	131	15.89	5.61	16.61	5.90	-1.36	0.000	**
FR	130	10.28	4.08	12.53	6.84	-4.35	0.000	**
CONTENT	131	33.93	10.79	46.28	14.24	-9.61	0.000	**
WGCTAI	23	6.04	2.36	6.87	1.687	-1.34	0.882	
A	23	9.21	2.76	10.26	3.09	-1.14	0.590	
D	23	9.35	2.15	9.17	2.17	-0.35	0.020	
INT	23	9.87	2.82	9.30	3.82	-0.59	0.731	
ARG	21	8.76	3.42	10.86	3.67	-2.32	0.162	
T	23	42.48	8.69	46.91	5.87	-2.50	0.084	
PER	23	43.35	25.10	55.87	20.21	-2.35	0.076	
MAPSWA	116	6.47	1.74	6.60	2.02	-0.94	0.000	**
V	132	4.72	2.15	4.47	2.47	-1.38	0.000	**
CL	109	6.11	1.81	5.61	4.62	-1.12	0.260	
CI	132	6.05	2.40	6.39	2.54	-1.63	0.000	**
CE	132	4.64	2.35	3.52	2.16	-4.50	0.016	
CT	132	15.74	5.85	14.96	7.65	-1.07	0.003	*
SS	131	11.00	3.27	12.26	3.18	-4.65	0.000	**
IA	16	0.38	0.61	0.68	0.70	-1.58	0.282	
T	131	36.94	8.89	36.85	6.24	-0.15	0.000	**

* .05 significance ** .01 significance

Table 7. t-TEST ON PRE AND POSTTEST GAINS FOR EXPERIMENTAL GROUP

t-Tests were performed on the gains of posttest scores over pretest scores to determine what, if any, significant gains were made by the experimental group. These gains can then be compared to those of the control group.

Variable Code	N	PRETEST		POSTTEST		T-VALUE	TWO-TAILED PROB.	SIGN.
		$\bar{X}$	SD	$\bar{X}$	SD			
SDRT RCL	147	16.88	6.85	19.73	6.75	-7.37	0.000	**
RCI	147	17.95	5.75	19.76	5.84	-5.08	0.000	**
RCT	147	34.73	12.005	39.48	12.004	-8.32	0.000	**
WM	146	16.40	5.15	18.35	5.38	-7.00	0.000	**
WP	146	18.29	5.63	20.46	5.25	-6.37	0.000	**
RA	147	7.86	2.87	9.38	2.92	-6.75	0.000	**
RB	147	7.80	3.062	9.07	3.802	-3.20	0.601	
RT	147	15.70	5.08	18.46	5.81	-5.77	0.000	**
FR	142	10.25	4.8	12.92	5.32	-5.91	0.000	**
CONTENT	147	34.97	18.83	58.74	26.16	-13.13	0.000	**
WGCTAI	39	6.69	2.56	9.05	12.00	-1.24	0.380	
A	39	10.21	2.64	10.18	2.58	-0.05	0.598	
D	39	9.05	2.43	10.23	8.46	-0.86	0.526	
INT	38	8.95	2.85	11.97	13.23	-1.35	0.565	
ARG	34	9.47	3.02	11.65	7.94	-1.61	0.242	
T	39	42.67	9.71	47.59	10.41	-2.90	0.004	*
PER	39	48.08	31.52	56.97	26.50	-2.54	0.000	**
MAPS WA	124	5.56	1.93	6.12	3.57	-1.67	0.063	
V	146	3.81	2.03	3.68	2.34	-0.86	0.000	**
CL	107	6.21	1.89	5.31	1.88	-5.15	0.000	**
CI	146	6.01	2.55	6.09	4.28	-0.22	0.000	**
CE	146	5.19	2.059	4.00	2.801	-4.35	0.026	
CT	146	15.67	6.03	14.20	4.01	-4.05	0.000	**
SS	146	10.82	4.14	11.29	4.21	-1.44	0.000	**
IA	22	0.59	0.66	0.68	0.64	-0.46	0.947	
T	146	35.16	9.19	33.71	7.48	-3.08	0.000	**

* .05 significance ** .01 significance

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Table 8. ANALYSIS OF COVARIANCE

Analysis of covariance was done on the posttests using the pretests as the covariate to determine what, if any, significant difference may exist between experimental and control groups.

Variable Code	EXPERIMENTAL		CONTPOL		MAIN EFFECTS		SIGN
	N	$\bar{X}$	N	$\bar{X}$	F-RATIO	F-PROB	
SDRTRCL	147	19.73	107	16.95	4.36	0.038	*
RCI	147	19.76	107	17.60	5.069	0.025	*
RCT	147	39.48	107	34.54	6.317	0.013	*
WM	146	18.35	133	16.89	9.422	0.002	**
WP	146	20.46	133	19.25	6.309	0.013	*
RA	147	9.38	131	8.44	7.708	0.006	**
RB	147	9.07	128	8.20	4.020	0.046	*
RT	147	18.46	131	16.61	9.331	0.002	**
FR	142	12.92	130	12.53	0.384	0.536	
CONTENT	147	58.74	131	46.28	28.156	0.000	**
WGCTAI	39	9.05	23	6.87	0.551	0.461	
A	39	10.18	23	10.26	0.012	0.913	
D	39	10.23	23	9.17	0.421	0.519	
INT	38	11.97	23	9.30	0.715	0.401	
ARG	34	11.65	21	10.86	0.065	0.799	
AT	39	47.59	23	46.91	0.077	0.783	
PER	39	56.97	23	55.87	0.079	0.780	
MAPSWA	124	6.12	116	6.60	0.997	0.000	*
V	146	3.68	132	4.47	0.307	0.580	
CL	107	5.31	109	5.61	0.499	0.481	
CI	146	6.09	132	6.39	0.488	0.485	
CE	146	4.00	132	3.52	1.467	0.227	
CT	146	14.20	132	14.96	1.222	0.270	
SS	146	11.29	131	12.26	5.253	0.023	*
IA	22	0.68	16	0.69	0.024	0.879	
T	146	33.71	131	36.85	13.639	0.000	**

* .05 significance ** .01 significance

RESULTS

From the start there was concern that a difference in learning ability might exist between the experimental and control groups since random selection was not possible and ability level did play some role in the selection process. As a result, we began with a null hypothesis which stated that the means of the DAT and SRA scores for the experimental group were equal to those of the control group. The alternate hypothesis was that their means were not equal.

Table 3 shows the results of analysis of variance on the DAT and SRA scores to determine if the difference between the control and experimental groups was significant. The table gives the number in each group, the mean and standard deviation for each group on the tests and subtests, and the F-ratios and F-probabilities obtained from analysis of variance. There was no significant difference at either the .05 or .01 level in the DAT scores. Four of eleven SRA subtests showed a significant difference at the .01 level. "Grasping Detail Comprehension" and "Reference Material, Parts of a Book" showed higher mean scores for the control group, while the experimental group had higher means for "Understanding Author Comprehension" and "Reference Material, Source of Information." The composite scores for all SRA sections showed no significant difference. The data seems to show that the experimental and control groups were very similar with respect to ability.

If the two groups are not significantly different then the pretest scores should be very similar. The tests used in this study were SDRT, WGCTA, MAPS, and a content test. Our null hypothesis stated that the

means of the pretest scores of the experimental group were not equal to those of the control group. The alternate hypothesis stated that their means were equal. Table 4 shows the number of students in each group, the means and standard deviations for each group, and the F-ratios and F-probabilities from an analysis of variance on each of the pretest means. Most of the F-ratios indicate no significant difference between the means of the pretest scores of the two groups. We reject the null hypothesis. The data seems to show that the experimental and control groups are very similar with respect to pretest scores.

To test the first part of our objective, we wished to determine if the students in the experimental group who received Project CAPABLE treatment improved their basic learning skills more than the students in the control group. The test used to determine the answer to this question were the SDRT, the WGCTA, and a MAPS test on reading skills. Since we expect that Project CAPABLE is effective in improving basic learning skills, our null hypothesis stated that the means of the posttest scores for the experimental group were equal to those of the control group. The alternate hypothesis stated that their means were not equal. Table 5 give the number of students in each group, the mean and standard deviation of each test for each group, and the F-ratios and F-probabilities from an analysis of variance on each of the posttest means. A significant difference (.05) is indicated in several areas of the project. The experimental group seemed to show significantly greater acheivement than the control group for the following basic learning skills as measured by the SDRT: literal comprehension, inferential comprehension, comprehension total, word meaning, word parts, scanning, skimming, and scan and skim total. We can

go even further to say that the results for literal comprehension, inferential comprehension, total comprehension, scanning, and scanning and skimming total were a great deal more significant than the .01 level. For these areas the null hypothesis is rejected and the alternate hypothesis accepted. The only area in this test not showing significant improvement was fast reading.

None of the WGCTA posttest scores showed any significant difference between experimental and control groups. We must accept the null hypothesis in the areas of critical thinking.

Most of the F-ratios for the MAPS posttest scores indicated no significant difference. For these we accept the null hypothesis. Those MAPS scores that showed a difference between the groups indicate a significant improvement of the control group, not the experimental group. For the areas of "Vocabulary" and "Study Skills" we accept the alternate hypothesis that in these two areas the control group scored significantly better than the experimental group

To test the second part of our objective, we wished to determine if the students in the experimental group who received the project treatment had greater achievement in subject area content than the control group. A teacher-made content pretest and posttest was administered. Since we expected that improving basic learning skills improves achievement in content, the null hypothesis stated that the means of the content posttest scores were equal to those of the control group. The alternate hypothesis stated that the means were not equal. As pointed out earlier, there was no significant difference in the pretest scores at the outset of the study. Not only was there a significant difference (.05)

between the experimental and control groups but the experimental group scored so much better that the F-probability is smaller than .0001. This result was brought about by a 20% greater acheivement by the experimental group.

Did the experimental group have greater gain on posttest scores over pretest scores? A t-test (of correlated/dependent samples) on the gain from pretest to posttest for each group was performed. This was done to determine if there was significant difference between the pre and posttests in the two groups and in which group the gain was larger. Our null hypothesis stated that the mean of the gain for the control group would be the same as the gain for the experimental group. The results of the t-tests are shown in Table 6 (control) and Table 7 (experimental). The results show that there was a significant difference between pre and post-tests for both the experimental and control groups in which the experimental had a stronger t-value than the control for the following areas of the SDRT: literal comprehension, inferential comprehension, conprehension total, word meaning, word parts, skimming, fast reading, and content. The null hypothesis can be rejected for these areas. This supports conclusions arrived a through analysis of variance discussed earlier.

If we assume that there was an initial difference with repect to learning ability between experimental and control groups, can we show through analysis of covariance that the experimental group had greater improvement in their basic learning skills and had greater achievement in subject area content than the control group? The pretests were used for covariate. The null hypothesis stated that the means of the posttest

scores for the experimental group were equal to those of the control group. The alternate hypothesis stated that their means were not equal. Analysis of covariance on the posttest scores is shown in Table 8. This table gives the number of students in each group for each test, the mean for each test in each group, and the F-ratio and F-probability for each test. A significant difference (.05) is indicated in generally the same areas as showed up in analysis of variance and t-test discussed earlier. The null hypothesis is rejected in these areas and the alternate hypothesis is accepted. Experimental group did score significantly better on the posttests for basic learning skills and content than did the control group.

The project failed to show a significant impact on the scores of the WGCTA. Instruction probably did not direct itself to the kinds of thought processes tested by WGCTA. In the future, more care must be taken in obtaining an instrument that measures what we intend to teach. Another possible reason for this lack of impact on the WGCTA could be that the exercises used to develop these critical thingking skills are ineffective. These, too, must be scrutinized to see if they can be improved in anyway.

The project also failed to show a significant impact on the scores of the MAPS test. Again, instruction may have been ineffective in teaching the kinds of skills tested by MAPS. Another possibility is that the pre and posttests are not equivalent. No check was done by the state department or by the project group to see if the questions chosen were of the same difficulty. It may be that the posttest was more difficult than the pretest. Perhaps the reason we received significant results from the SDRT and not from MAPS is that the SDRT is a nationally normed test and

form B is equivalent to form A. Also, in the MAPS test we chose only one or two items to represent each skill area. This probably is not enough. In the future, we should use at least four or five items to test an area. Finally, it is also possible that students took more care on the tests at the beginning of the year than they did in April.

SUMMARY OF RESULTS

1. There was little significant difference between control and experimental groups at the beginning of the study.

2. The experimental group scored significantly better on posttests in the areas of literal and inferential comprehension, word meaning, word parts, and skimming and scanning, as indicated by analysis of variance on posttest means.

3. The experimental group scored significantly better on posttests of subject area content matter as indicated by analysis of variance on the posttest means.

4. The t-test indicates that both the experimental and control groups scored significantly better in posttests than they did in pretests in the areas mentioned above. The experimental group had a greater gain on post-test over pretest.

5. Analysis of covariance indicates that the experimental group scored significantly better in the posttests mentioned above than did the control group.

CONCLUSION

Students in the experimental group who received Project CAPABLE showed a statistically significant gain (.05) in their command of basic learning skills and a statistically significant increase (.05) in their achievement in subject area content as compared to the control group.

It can further be said that many areas of basic learning skills and content showed educationally significant results, surpassing the .01 level and even .001 and .0001 levels of significance.